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FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
RASHID, DAVID	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/807,187	MITSUI, TADASHI	
	Examiner	Art Unit	
	David P. Rashid	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 December 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 July 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

All of the examiner's suggestions presented herein below have been assumed for examination purposes, unless otherwise noted.

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/7/2007 has been entered.

Amendments

2. This office action is responsive to the claim amendment received on 12/7/2007. Claims **1- 20** remain pending.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Section IV.C, reads as follows:

> While abstract ideas, natural phenomena, and laws of nature are not eligible for patenting, methods and products employing abstract ideas, natural phenomena, and laws of nature to perform a real-world function may well be. In evaluating whether a claim meets the requirements of section 101, the claim must be considered as a whole to

> determine whether it is for a particular application of an abstract idea, natural phenomenon, or law of nature, rather than for the abstract idea, natural phenomenon, or law of nature itself.
>
> For claims including such excluded subject matter to be eligible, the claim must be for a practical application of the abstract idea, law of nature, or natural phenomenon. Diehr, 450 U.S. at 187, 209 USPQ at 8 ("application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection."); Benson, 409 U.S. at 71, 175 USPQ at 676 (rejecting formula claim because it "has no substantial practical application").
>
> To satisfy section 101 requirements, the claim must be for a practical application of the Sec. 101 judicial exception, which can be identified in various ways:
>
> > The claimed invention "transforms" an article or physical object to a different state or thing.
> >
> > The claimed invention otherwise produces a useful, concrete and tangible result, based on the factors discussed below.

5. **Claims 1-20** are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 1-20 recites the mere manipulation of data or an abstract idea, or merely solves a mathematical problem without a limitation to a practical application. A practical application exists if the *result* of the claimed invention is "useful, concrete and tangible" (with the emphasis on "result")(Guidelines, section IV.C.2.b). A "useful" result is one that satisfies the utility requirement of section 101, a "concrete" result is one that is "repeatable" or "predictable", and a "tangible" result is one that is "real", or "real-world", as opposed to "abstract" (Guidelines, section IV.C.2.b)). Claims 1-20 merely manipulates data without ever producing a useful, concrete and tangible result.

Claims 1-20 are rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter because the claimed invention is directed to a judicial exception and is not directed to a practical applicant of such judicial exception (though the claims produce what is considered a useful and concrete result, the claims do not require any physical transformation and the invention does not produce a tangible result).

MPEP SECTION 2106 (IV)(C)(2)(b)(2) titled "TANGIBLE RESULT" reads as follows:

> ...the tangible requirement does require that the claim must recite more than a 35 U.S.C. 101 judicial exception, in that the process claim must set forth a practical application of that judicial exception to produce a real-world

> result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had "no substantial practical application.").

and MPEP SECTION 2106 (II)(C) reads as follows:

> As a general matter, the grammar and intended meaning of terms used in a claim will dictate whether the language limits the claim scope. Language that suggests or makes optional but does not require steps to be performed or does not limit a claim to a particular structure does not limit the scope of a claim or claim limitation. The following are examples of language that may raise a question as to the limiting effect of the language in a claim:
> (A) statements of intended use or field of use,
> (B) "adapted to" or "adapted for" clauses,
> (C) "wherein" clauses, or
> (D) "whereby" clauses.

For example, the method of independent claim 1 is directed to the actions of "storing a plurality of images", "scan the image" (within a processor), "calculate a standardized correlation value", "determine an in-focus state", "select one of the images", and "to process...to measure" which could all be done on a hardware implementation free from any "real-world result" as there could be no real-world application. The analyzing step of claim 1 only requires an image that may already be stored within a computer, an image that was captured by an external imaging device (thus inducing tangibility and physicality), but the capturing itself by the external imaging device is not <u>positively recited</u> (and so the method step remains intangible). It would be suggested to take the capturing element itself and make it a separate element to <u>positively recite</u> it.

Another example - the method of independent claim 7 cites "on the basis of an image of the pattern that is supplied from the external imaging device, the external imaging device capturing the image of the pattern with an optical system" that is not <u>positively recited</u> for two reasons, (i) it being in the preamble such that the examiner need not consider it, and (ii) it not being a separate element to <u>positively recite</u> it. It would be suggested to make the first element (or its equivalent) as follows "an external image device to capture a physical image of the pattern with an optical system;". This would

induce physical transformation outside the computer (converting a physical image into a computed output) and thus tangibility.

In order to for the claimed product to produce a "useful, concrete and tangible" result, recitation of one or more of the following elements is suggested:

- The manipulation of data that represents a physical object or activity transformed from outside the computer.
- A physical transformations outside the computer, for example in the form of pre or post computer processing activity.
- A direct recitation of a practical application;

Applicant is also advised to provide a written explanation of how and why the claimed invention (either as currently recited or as amended) produces a useful, concrete and tangible result.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **1-2, 4-5, 11-12, 14-15, 17,** and **19** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination between Takane et al. (US 6,538,249) and Gleason et al. (US 6,456,899 B1).

Regarding **claim 1**, while Takane discloses a pattern measuring apparatus ("[First embodiment] FIG. 3 is a diagram used to describe focus deviations which are a problem to be solved by the present invention.", column 5, line 58) comprising:

a storing device (FIG. 1, element 111) to store a plurality of images of a pattern to be measured ("IMAGE EACH HAVING DIFFERENT FOCUS" in FIG. 11) and predetermined edge reference data ("SOBEL FILTER IMAGES" in FIG. 11), the predetermined edge reference data comprising a plurality of pixels that have an intensity gradient (the Sobel filter images comprise a plurality of pixels having an intensity gradient), the images having been captured by an external imaging device (FIG. 1, element 104) at different focal distances;

a processor (FIG. 1, element 111) to, for each of the images, (i) scan the image, using the predetermined edge reference data, to detect edge points of the image ("the Sobel filter is used to extract edge information in the image" in Col. 6, lines 64-65) and (ii) output a plurality of correlation values (the correlation values being the pixel values of each Sobel filter image in FIG. 11 in correspondence to the location with the images; Sg1, Sg2, Sg3, Sg4, Sg5 in FIG. 11) that indicate correlations between the edge reference data and the edge points;

a calculator (FIG. 1, element 111) to, for each of the images, calculate a standardized correlation value ("max(Sg1, Sg2, Sg3, Sg4, Sg5)" in FIG. 11) that expresses a correlation between the predetermined edge reference data and the detected edge points of the image, based on the correlation values;

a determinator (FIG. 1, element 111) to, for each of the images, determine an in-focus state ("max(Sg1, Sg2, Sg3, Sg4, Sg5)" in FIG. 11 is also the determined in-focus state) of the image, based on the standardized correlation value for the image; and

an image selector (FIG. 1, element 111) to select one of the images from the plurality of images ("g2" in the "COMPOSITE IMAGE" in FIG. 11 was selected from one of the images), the determined in-focus state of the selected image matching a preselected in-focus state ("g2" matches

"Sg2"; FIG. 6, element 603; FIG. 7, element 703 wherein the preselected in-focus state is the decider algorithm in "preselecting" which image is the in-focus state), Takane does not teach a measurer to process the selected image to measure the pattern.

Gleason discloses a context-based automated defect classification system using multiple morphological masks ("It is an object of the invention to provide an automated semiconductor wafer defect classification system that classifies defects based on a combination of their location with respect to process layers of the semiconductor wafer and the defect characteristics.", column 1, line 45) that teaches a measurer to process the selected image to measure the pattern ("The next component of the defect feature-based classifier 36 is the defect feature selector 32. It takes as its input the list of defect features 34, and pares that list down into a selected set of features 35. The defect feature selector 32 pares down the feature list 34 by accessing the knowledge base 23 and retrieving a list of existing discriminatory features for the current semiconductor device under inspection. This list of discriminatory defect features 34 is then passed on to the defect classifier 33.", column 5, line 1.).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the pattern measuring apparatus of Takane to include the measurer of Gleason to process the selected image of Takane and to measure the pattern as taught by Gleason so that "...the usefulness of each individual feature for a given situation is determined...".., Gleason, column 9, line 6 and "to provide an automated semiconductor wafer defect classification system that classifies defects based on a combination of their location with respect to process layers of the semiconductor wafer and the defect characteristics.", Gleason, Col. 1, lines 45 – 50.

Regarding **claim 2**, while Takane in view of Gleason discloses wherein the external imaging device includes an optical system that is capable of adjusting focal position thereof within a range defined by an integer multiple of a predetermined step width from a predetermined initial value ("FIG. 2 is a graph showing changes in a focus evaluation value as electron lens conditions are changed;", column 2, line 66. As shown in FIG. 2, the changes in focus (exciting current of electron lens) are shown from 0 to 20, which are integer multiples of a predetermined step width (unit 1) from a predetermined initial value (unit 0). The electron microscope disclosed can adjust its focal position thereof within this range.), and the plurality of images have been captured at each of a plurality of focal positions calculated by adding integral multiples of the step width to the initial value (Each focus evaluation taken from FIG. 2 is from an integer multiple of the unit 1, and these are applied to the current embodiment as follows: "FIG. 11 is a schematic diagram showing a composing process according to the present invention. The figure illustrates an example in which pixel values from a Sobel filter are set as in-focus evaluation references.", column 6, line 60.).

Regarding **claim 4**, while Takane in view of Gleason discloses the pattern measuring apparatus according to claim 1, wherein the image selector (FIG. 1, element 111) selects a plurality of the images determined in-focus states of the selected images matching preselected in-focus states (refer to references/arguments in claim 1), and

the pattern measuring apparatus further comprises an image processor (FIG. 1, element 111) to perform alignment processing among the selected images and perform image processing to combine the images (refer to references cited in claim 1; "An optical microscope image acquired by magnifying the alignment pattern a few hundreds times is compared with an alignment pattern reference image registered in the memory unit 3015, and correct the stage position coordinates to

exactly align the visual field of the optical microscope image with that of the reference image.", column 16, line 50), Takane does not teach the measurer measures the pattern on the basis of the combined pattern images.

Gleason discloses a context-based automated defect classification system using multiple morphological masks ("It is an object of the invention to provide an automated semiconductor wafer defect classification system that classifies defects based on a combination of their location with respect to process layers of the semiconductor wafer and the defect characteristics.", column 1, line 45) that teaches a measurer measuring the pattern on the basis the images ("The next component of the defect feature-based classifier 36 is the defect feature selector 32. It takes as its input the list of defect features 34, and pares that list down into a selected set of features 35. The defect feature selector 32 pares down the feature list 34 by accessing the knowledge base 23 and retrieving a list of existing discriminatory features for the current semiconductor device under inspection. This list of discriminatory defect features 34 is then passed on to the defect classifier 33.", column 5, line 1.).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the pattern measuring apparatus of Takane to include the measurer of Gleason to process the selected image of Takane and to measure the pattern as taught by Gleason so that "...the usefulness of each individual feature for a given situation is determined..."., Gleason, column 9, line 6 and "to provide an automated semiconductor wafer defect classification system that classifies defects based on a combination of their location with respect to process layers of the semiconductor wafer and the defect characteristics.", Gleason, Col. 1, lines 45 – 50.

Regarding **claim 5**, while Takane in view of Gleason discloses the pattern measuring apparatus according to claim 1, the Takane in view of Gleason does not teach wherein only edge

points that have been detected in previously scanned images and that are within a predetermined range are scanned with the predetermined edge reference data.

Gleason discloses a context-based automated defect classification system using multiple morphological masks ("It is an object of the invention to provide an automated semiconductor wafer defect classification system that classifies defects based on a combination of their location with respect to process layers of the semiconductor wafer and the defect characteristics.", column 1, line 45) that teaches wherein only edge points that have been detected in previously scanned images ("Next, in the layer feature selector 17, columns of features from the table 19 are selected using information stored in the knowledge database 23. The stored information is information that had been previously generated in an off-line training and analysis procedure. The layer feature selector 17 then performs statistical analysis on the training features, and each feature is ranked based on its ability to discriminate between possible classes. The information in the database 23 is considered a recipe generated for a specific set of operating conditions, e.g., wafer size, processing step, geometry. The new list of features 20 that is generated from this selection is a subset, or possibly all, of the original features 19.", column 6, line 25.) and that are within a predetermined range ("FIG. 3 shows the background layer segmenter 13 in more detail. It includes a difference-of-Gaussians edge detector 47 which carries out edge extraction using a difference-of-Gaussians method; an excess colorspace converter 48 which transforms the intensity values of the reference image; and a continuous region labeler 49 which segments the regions based on edge boundaries, image intensity measurements, adaptive thresholding, and finally a morphological closing process that results in the segmented reference image 14.", column , line wherein the edge detector uses a threshold (predetermined range) to create layers that are then considered for the knowledge database 23 to be compared with later if

accepted into the knowledge database 23.) are scanned with predetermined edge reference data (Scanning for the data already in the knowledge database 23 and the image data currently being compared is considered scanning "with" each other.).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate into the pattern measuring apparatus of Takene wherein only edge points that have been detected in previously scanned images so for creating and that are within a predetermined range are scanned with predetermined edge reference data as taught by Gleason "to provide an automated semiconductor wafer defect classification system that classifies defects based on a combination of their location with respect to process layers of the semiconductor wafer and the defect characteristics.", Gleason, Col. 1, lines 45 – 50.

Regarding **claim 11**, claim 1 recites identical features as in claim 11. Thus, arguments equivalent to those presented above for claim 1 is equally applicable to claim 11.

Regarding **claim 12**, claim 2 recites identical features as in claim 12. Thus, arguments equivalent to those presented above for claim 2 is equally applicable to claim 12.

Regarding **claim 14**, claim 4 recites identical features as in claim 14. Thus, arguments equivalent to those presented above for claim 4 is equally applicable to claim 14.

Regarding **claim 15**, claim 5 recites identical features as in claim 15. Thus, arguments equivalent to those presented above for claim 5 is equally applicable to claim 15.

Regarding **claim 17**, Takane discloses wherein the standardized correlation value is calculated by using a plurality of sets of predetermined edge reference data (As described above, the standardized correlation value is the maximum equation in FIG. 11 which involves a plurality of sets

of the edge reference data (Sobel filter images). A pixel from each edge reference data is inputted into the standardized correlation value.).

Regarding **claim 19**, claim 11 recites identical features as in the method of manufacturing of claim 19. Thus, arguments equivalent to those presented above for claim 11 is equally applicable to claim 19.

8. **Claims 3** and **13** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination between Takane et al. (US 6,538,249) "first embodiment" and Gleason et al. (US 6,456,899 B1), in further view of Takane et al. (US 6,538,249) "eighth embodiment".

Regarding **claim 3**, the combination between Takane "first embodiment" and Gleason disclose the pattern measuring apparatus according to claim 1, while Takane "first embodiment" further discloses

wherein the image selector selects a plurality of the images, the determined in-focus states of the selected images matching pre-selected in-focus states (refer to references/arguments in claim 1);

the pattern measuring apparatus further comprises an image processor to perform alignment processing among the selected images and superimpose in a single coordinate system the edge points of the pattern within the selected images (refer to references/arguments cited in claim 1); and

the measurer measures the pattern on the basis of position coordinates of the edge points that have been superposed in the single coordinate system (refer to references/arguments cited in claim 1), however Takane "first embodiment" does not teach the pattern measuring apparatus further comprising an image processor which performs alignment processing among the selected plurality of images.

Takane "eighth embodiment" teaches a pattern measuring apparatus further comprising an image processor which performs alignment processing among images ("An optical microscope image acquired by magnifying the alignment pattern a few hundreds times is compared with an alignment pattern reference image registered in the memory unit 3015, and correct the stage position coordinates to exactly align the visual field of the optical microscope image with that of the reference image.", column 16, line 50).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to teach an image processor which performs alignment processing among pattern images as taught by Takane "eighth embodiment" "...to correct the position coordinate system on the X-Y stage and the pattern position coordinate system in the wafer.", Takane "eighth embodiment", column 16, line 48.

Regarding **claim 13**, claim 3 recites identical features as in claim 13. Thus, arguments equivalent to those presented above for claim 3 is equally applicable to claim 13.

9. **Claims 6** and **16** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination between Takane et al. (US 6,538,249) "first embodiment" and Gleason et al. (US 6,456,899 B1), in further view of Takane et al. (US 6,538,249) "fourth embodiment".

Regarding **claim 6**, the combination between Takane "first embodiment" and Gleason disclose the pattern measuring apparatus according to claim 1, and while the Takane "first embodiment" further discloses

the calculator classifies the detected edge points into edge point group for each of the edges, and calculates a standardized correlation value for each of the edge point groups that have been

classified, (The groups (referred to as "sections" by Takane) are those shown in FIG. 4 of the first embodiment of the invention (showing two in-focus groups). Refer to the references cited in claim 1. The calculator classifies every pixel of the image with the maximum function, thus the calculator naturally classifies edge points that have been detected into edge point groups for each of the edge lines, and further calculates a characteristic quantity for each of the edge point groups that have been classified.); and

the determinator determines the in-focus state of the image for each of the edge point groups that have been classified (Refer to the references cited in claim 1. The determinator determines every pixel of the image with the full conditional maximum function, thus the determinator naturally determines the in-focus state of the pattern image for each of said edge point groups that have been classified.), the combination does not teach wherein the pattern has a plurality of edge lines (Takane "first embodiment", FIG. 4 discloses a "hole" of the "first embodiment" which only has one edge line – the circle itself).

Takane "fourth embodiment" teaches a pattern measuring apparatus further comprising wherein the pattern has a plurality of edges (" FIG. 9 shows indication examples for displaying composite images on a real time basis according to the present invention.", column 9, line 60. The pattern shown in FIG. 9 are holes, each with two edge lines and hence a plurality of edge lines.)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to teach the pattern having a plurality of edges as taught by Takane "fourth embodiment", to differentiate a plurality of sections of the pattern to be further processed by the disclosed invention.

Regarding **claim 16**, claim 6 recites identical features as in claim 16. Thus, arguments equivalent to those presented above for claim 6 is equally applicable to claim 16.

Response to Arguments

10. Applicant's arguments filed 12/7/2007 with respect to **claims 1, 7, 11,** and **18-20** have been respectfully and fully considered, but they are not found persuasive.

Summary of Remarks regarding **claim 1:**

Applicant argues it would not have been obvious for one of ordinary skill to combine the teachings of *Takane et al.* and *Gleason et al.* to obtain a pattern measuring apparatus comprising, inter alia, "a processor to, for each of the images, (i) scan the image, using the predetermined edge reference data, to detect edge points of the image," as recited in independent claim 1 as amended (emphasis added). Even the combination of teachings from *Takane et al* and *Gleason et al* that is apparently suggested by the Examiner fails to include "scan[ning] the image, using the predetermined edge reference data, to detect edge points of the image," as recited in claim 1 (*@ response page 16*).

However, *Takane et al.* does not teach or suggest "scan[ning] the image, using the predetermined edge reference data, to detect edge points of the image," as required by claim 1. A Sobel filter computes an approximation of the gradient of an image intensity function. But merely computing an intensity gradient, as performed by the Sobel filter in *Takane et al.,* does not constitute "scan[ning] the image, using the predetermined edge reference data, to detect edge points of the image," as recited in claim 1 (emphasis added). For example, *Takane et al.* does not teach or suggest any "predetermined edge reference data," as required by claim 1 (emphasis added). The intensity gradient of *Takane et al.* is not "predetermined," but rather generated in the same "computing" process that the Examiner relies on as allegedly constituting the "scan[ning]" process of claim 1. Moreover, for at least this reason, computing the intensity gradient, as taught by *Takane et al,* cannot constitute

"~" the intensity gradient, as required by claim 1 (emphasis added). Edge reference data cannot be "used" before it has been generated. Thus, *Takane et al.* fails to teach or suggest "scan[ning] the image, using the predetermined edge reference data, to detect edge points of the image," as required by claim 1 (*@ response pages 17-18*).

Gleason et al. does not make up for the deficiencies of *Takane et al* because *Gleason et al.* also fails to teach or suggest "scan[ning] the image, using the predetermined edge reference data, to detect edge points of the image," as recited in claim 1. The Examiner does not rely on *Gleason et al* for any teaching or suggestion of "scan[ning] the image, using the predetermined edge reference data, to detect edge points of the image," as required by claim 1 (*@ response page 18*).

Examiner's Response regarding **claim 1:**

However, in consideration of the predetermined edge reference data being the Sobel filter image itself, Takane does disclose scanning the image using the predetermined edge reference data to detect edge points of the image as clearly shown in FIG. 11, as well as outputting a plurality of correlation values (those values in the Sobel filter images may be considered correlation values since there does exist a "correlation" between *e.g.* "g2" and "Sg2") that indicate correlation between the edge reference data and the edge points.

Computing the intensity gradient using the Sobel filter is preparing for the scanning step by creating the predetermined edge reference data. The Sobel filter images may be considered predetermined edge reference data, as (i) it has been predetermined to compute them before the calculating and determining steps and (ii) they contain edge data of the images for the images to reference to.

Summary of Remarks regarding **claims 7, 11,** and **18-20:**

Applicant argues independent claims 7, 11, and 18-20 are not rendered obvious by *Takane et al.* and *Gleason et al.* for reasons substantially similar to those explained above in relation to claim 1. For example, *Takane et al.* and *Gleason et al.* fail to teach or suggest, alone or in combination, a method comprising, inter alia, "detecting edge points of each of the images by scanning the image using predetermined edge reference data," as recited in claim 11 (emphasis added).

Thus, since *Takane et al.* and *Gleason et al.* do not render obvious "scan[ning] the image[,] using [the] predetermined edge reference data," to "detect[] edge points" of the image, as recited in independent claims 1, 7, 11, and 18-20, these claims and claims 2-6, 8-10, and 12-17, which depend from some of these independent claims, are allowable over *Takane et al.* and *Gleason et al.*

Examiner's Response regarding **claims 7, 11,** and **18-20:**

However, *Takane et al.* discloses a method comprising, inter alia, "detecting edge points of each of the images by scanning the image using predetermined edge reference data," as recited in claim 11 at least for the reasons given above.

Conclusion

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David P. Rashid whose telephone number is (571) 270-1578. The examiner can normally be reached Monday - Friday 8:30 - 17:00 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571) 272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David P. Rashid/
Examiner, Art Unit 2624

David P Rashid
Examiner
Art Unit 2624

VIKKRAM BALI
PRIMARY EXAMINER